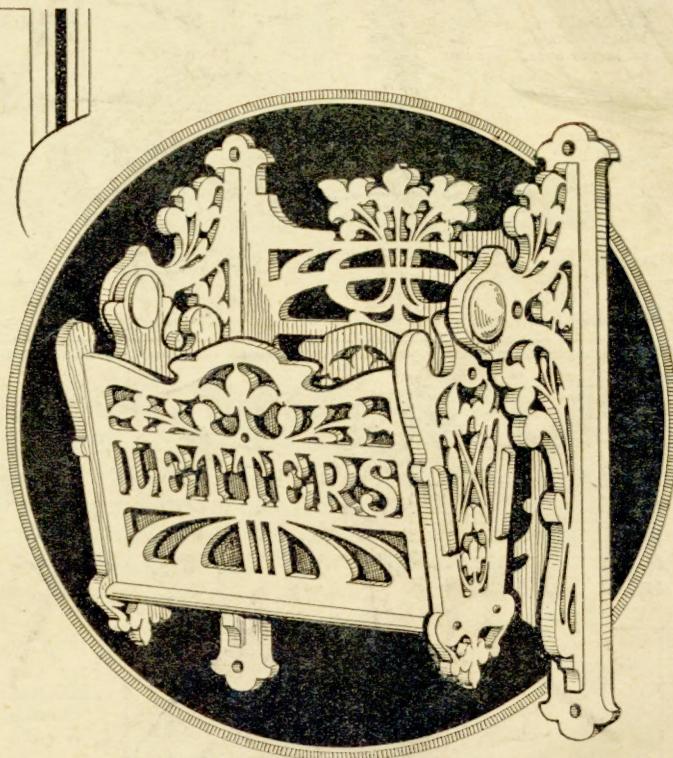


Hobbies

WEEKLY

FREE DESIGN
INSIDE FOR A
NOVEL LETTER RACK

Chemistry
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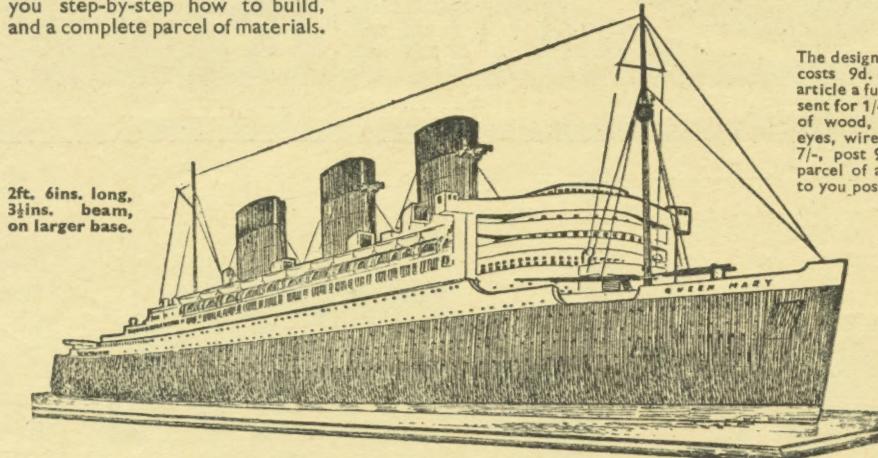
January 29th. 1938

Vol. 85. No. 2206

**THE FRETTWORKER'S AND
HOME CRAFTSMAN'S JOURNAL**

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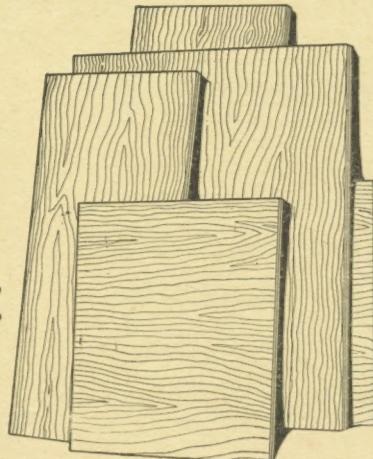
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Hobbies

WEEKLY



January 29th. 1938

Vol. 85. No. 2206

A SWING LETTER HOLDER

A LETTER rack is, after all, a necessity in every home and there is, therefore, the need for one to be made for all your friends even if you have one in your own house. The novel style of the one illustrated is something quite out of the common, and will appeal to anyone.

The cost of making it is quite reasonable, and all the wood is supplied in the special parcel of Hobbies as mentioned herewith. The work of cutting is, of course, undertaken with the fretsaw, and the patterns are provided full size on the design sheet given with this issue.

Careful Joints

The construction is simple, but there are several mortise and tenon joints which will demand care and attention to get them to fit together well. Many workers who are otherwise excellent in the ordinary details, do not give sufficient attention to these important parts. One can always tell by this particular joint, whether the worker is a craftsman or not.

It is, of course, quite easy to cut out the two parts to fit together in a slovenly manner, but that is not a job of which anyone can be proud.

The mortise which has the slot portion should be just large enough to accommodate the projecting piece—which is the tenon. Not only does this make a good-looking part, but also provides rigid strength when the article is in use.

You must remember in cutting the mortises that it is never advisable to cut on the outside of the line because obviously if you have cut the opening too large the board which goes into it cannot be made to fit.

It is, therefore, always advisable to get the

mortises on the small side, then you can always glasspaper the tenons down to make them snug and comfortable.

One small note, too, ought to be mentioned about this glasspapering, and that is to be sure to use it flat on to the wood. Obviously, if you press more heavily as is the tendency, on the outer edge of the tenon, you will have it tapering towards that part; in consequence, whilst the inner edge of the tenon may fit tightly, the outer edge will allow the part to wobble and so gradually become loose.

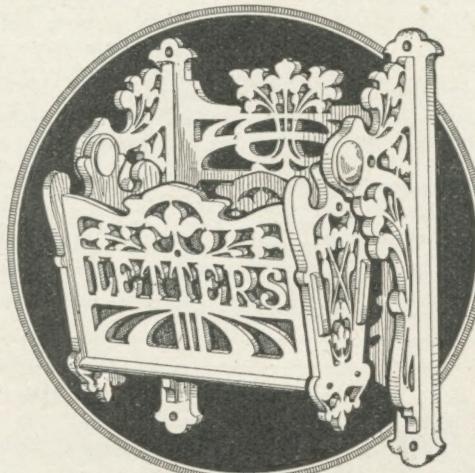
In the work in question, mortise and tenon joints are used to hold the two upright portions to the back. Again, the back and front of the actual swinging letter rack are tenoned in to the ends, and here again attention must be paid. Notice the difference in those of the back and those of the letter rack.

In the former instance the length of the tenons is exactly the same as the thickness of the wood into which they pass. They will thus come flush with the back surface of this part, and not project beyond.

In the case of the letter rack the tenons are a little longer, and in consequence project right through the ends. This is done purposely.

If they were cut off flush with the ends themselves they could still be seen, and would look unsightly. By allowing them to project a little and turning the corners round slightly, a much better appearance is given.

The general construction can be seen from the picture of the completed article and the details herewith. To the back are fixed two upright ends, each held in place by a couple of mortise and tenon joints.

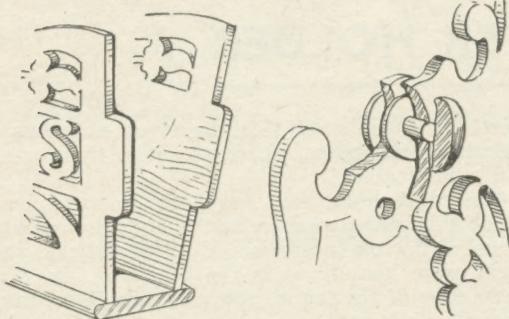


Between these two ends is hung the letter rack or basket portion. This is a holder tapering towards the bottom and allowed to swing very slightly on two pivot points of dowelling.

The front and back of the letter rack are fitted into the ends, then a floor is fitted beneath.

Design Extension

That, in general, is the construction, but, of course, there are one or two points to notice in cutting and making up. First of all, the design for the floor is shown on the sheet split. It consists of a rectangle 2ins. wide and 6ins. long, cut from $\frac{3}{16}$ in. wood, and there is really no need to paste the pattern down.



A view of the swinging letter holder without end

The dowel pivot, washers, etc. of the rack

All other parts are shown full size, and can be cut out and cleaned with glasspaper in the usual way. When you are cutting out, measure the mortise and tenon joint before actually cutting any of the wood.

Ensure the width and length of each part is correct, then when you have tested them in place and found them satisfactory, make an appropriate pencil mark on each portion. They can thus be returned together without getting mixed up with other parts.

The Lettering

The front of the basket contains the word "Letters," but the back has only a small amount of fretwork along the upper portion. Both these fretted openings can be backed up with thin wood or veneer paper, or even coloured material. This will serve to make a complete background for the letters, and also bring the fretwork out in strong relief.

If you are going to stain the whole thing, by the way, remember to do this work before adding

the lining. A detail is given here of the swing portion, with one end removed.

It will be noted that the lower edges of the sides must be chamfered slightly to get them to bed on the base on the bottom, and slope outwards towards the top.

A Projecting Floor

Notice, too, that the edges of the floor project beyond these sides, and are rounded off nicely with glasspaper. The three parts fit between the two ends and the floor is held additionally by two round-headed screws if necessary.

If, however, all the parts are cut square and true, the ends will bed up quite sufficiently with glue.

A detail is also given of the manner in which the basket portion is swung. Two $\frac{1}{2}$ in. lengths of $\frac{3}{16}$ in. diameter dowelling form the spindles. They are glued into the circle cut in the ends, then passed through the end of the letter basket itself.

Notice there is a thin washer of $\frac{1}{16}$ in. wood placed between the end and the end of the basket. This allows sufficient play for the part to swing slightly.

A Cover Disc

The inside end of the dowelling is covered with another $\frac{1}{16}$ in. thick disc cut as a solid circle, and glued on. Outside the end of the dowelling is covered by one of the fancy turnings (No. 20) supplied. The flat surface of this, by the way, will need scratching with a knife or scraping up so the glue holds it securely.

All the parts should be carefully cut and thoroughly cleaned before they are finally put together, and any little discrepancies taken out with one of the small fretwork files.

Before the Lining

If you are going to stain and polish the parts treat them now before adding the lining. If, however, you have cut it out in mahogany as supplied, there is really no need to do anything more to it.

The whole thing is hung by two brass-headed nails, through the two holes at the top ends in the back.

MATERIALS SUPPLIED

For making this Rack we supply a parcel of Mahogany, including two No. 20 Turnings, and sufficient round rod for the spindles, for 2/9 (post free 3/3).

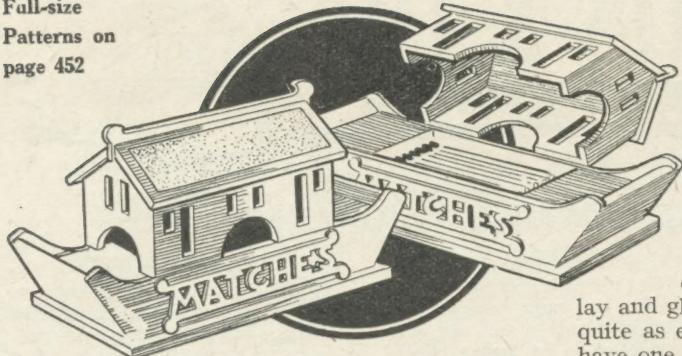


Bind your own Hobbies

Here is a simple binding case for you to keep your Hobbies in neat and clean. The Azabook cover is in stiff card, attractively bound, and provided with a solid back. Each copy of Hobbies is fixed in position merely by pressing

in place two metal staples. Price complete, 3/6 post free, including two dozen fastening staples, from Hobbies, Dereham, Norfolk. It is a cover worth having and quite easy to use each week as you get your copy of Hobbies.

Full-size
Patterns on
page 452



THE little novelty illustrated herewith is one which will appeal to anyone, and any owner of the fretsaw can make it up from a few odd bits of wood. Full size patterns are given on page 452 and the completed article if nicely made and painted, is just the thing to sell readily and in good numbers to fancy shops, or at Bazaars, Exhibitions, etc.

The pictures herewith explain themselves almost. The little Noah's Ark is only a miniature 5ins. long and 2ins. wide. The Ark portion really is hinged into the boat portion, and when tipped over as shown in the second picture, we have inside a container for matches. When one is extracted, the ark is tipped back into place and the scratching surface for the match provided along the roof.

Nicely painted in bright Crusoe enamel, the thing will be sure to make an appeal.

Constructional Details

Now let us look at the construction and mark out the parts on wood, or paste the patterns down as printed. Notice that the wording "Matches" is not cut from the piece of wood in which it is shown, but is pasted down to a separate piece of thin board, ivorine, xylonite or similar composition.

First of all cut out the base in 3/16in. wood, then the two sides of the boat from 1/8in. wood. Pieces A B and C are next cut, two of each being needed. One of the long edges of part A is rounded and the other is sloped off to a chamfer with a plane or file.

Glue this piece A between the two sides of the boat, sloping in line with the end. The chamfered straight edge should be flush with the bottom of the boat, and stand on the base.

Then get the part B and chamfer one of the long edges of this. Glue this piece also between the sides flush with the straight edge of the top, and close to the inside of the part A.

Floor Support

At the same time, have the piece C ready, and glue this as a support between the floor and the part B. These three pieces are shown in the detail at Fig. 1 where one side has been taken away to make it obvious.

Both ends of the boat are treated in this way, and the actual position is indicated by the dotted lines on the pattern of the side.

NOAH'S ARK MATCH HOLDER

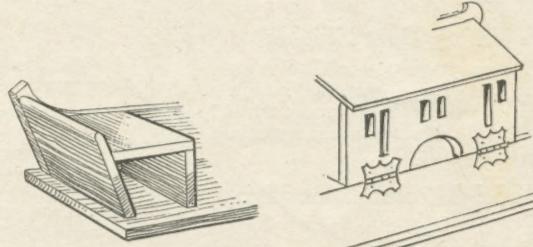
The boat is finished off by the addition of the word "Matches" cut as an overlay and glued on the side. It will, of course, be quite as easy to cut two at the same time, and have one fixed to each side.

The "Ark"

Now let us look at the house portion. Get out the two ends, the two sides and the ridge of the roof. Glue the ends between the sides. The ridge of the roof runs along from end to end, sinking into the slot of these parts. Make this a strong box-like shape, then add the roof from two pieces of 1/8in. wood the size shown.

Notice one edge of each roof piece must be chamfered so it lies snugly against the ridge. The other long edge, of course, is square and overhangs the sides.

You can if you wish, stiffen up the inside of this house portion with little match-like strips along the corners inside, but if the edges of the wood have been cut flat and straight, the glue should be sufficient to have made a good job of it.



Showing boat construction How the ark is hinged

Next, the two parts—the house and the boat—have to be joined together and a pair of hinges are added to the side of the house and of the boat itself.

As these will be seen, it is advisable to use a fancy pair of hinges, and Hobbies No. 5308—1/8in. long—are just the thing. Their method of fixing is quite simple and Fig. 2 shows their position.

A Striking Patch

The article is completed by the addition of a piece of emery paper or the side of a matchbox being glued on to the roof. The tray from the box is dropped into the compartment in the boat and the matches laid in it.

As previously mentioned, the whole thing should be painted up nicely and a good plan is to make the wording "Matches" stand out strongly by painting it a totally different colour from the rest of the work.

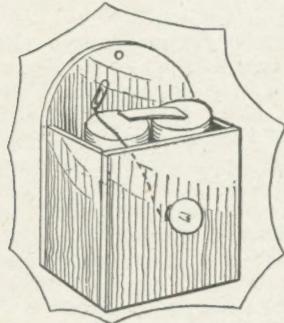
HINTS & TIPS WORTH KNOWING



For original Tips published the sender will receive a Hobbies Handy Propelling Pencil. We cannot acknowledge all those received, or guarantee to print them. Send to The Editor, Hobbies Weekly, Dereham, Norfolk. Keep them short and add rough pencil sketches if possible.

Simple Electric Light

MAKE a box out of plywood, large enough to hold a two cell battery. Make a hole in the front large enough to hold a bulb, pass a piece of flex through



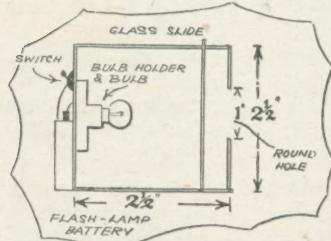
this and twine one end round the bulb and push into hole. To light the lamp, fix one end on to the top connection of battery.—(N. Sennitt).

Viking Boat Shields

IF you have a model Viking vessel and want the paddle shields, get a drawing pin fixed to the side of it above the paddles.—(D. Smith).

Model Theatre Spot Light

YOU will find this spot light very useful for a puppet show. The things required would be a cardboard box as in the sketch, and four pieces of glass,



one red, one blue, one green and one white bulb, bulb holder, battery and switch. The drawing shows their arrangement and the way the coloured glass can be made to slide in as required.—(R. Weatherston).

An Aerial

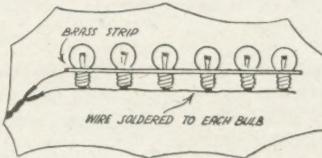
IF you have a wireless set why not try fixing your aerial to your bedstead to use the set in your room. As long as this makes a clean joint you will have a serviceable aerial. Of course, it must be connected to ironwork with a clean joint.—(A. Freeman).

Tarnish Remover

FOR removing tarnish from nickel and other metals, soak a soft cloth in warm water and rub softly. This will remove most of it.—(H. Burrows).

Bulb Holders

WHEN I made the Puppet Show described a few weeks ago, I found I had no bulb holders, this is how I made them. Take a piece of brass 9ins. by 1in. and



drill nine holes in it to suit the bulbs. Then get a 9in. length of brass wire and solder it to the bulbs as shown in the sketch. Solder the covered wire to it and connect up to the battery.—(A. Hill).

Coronation Chair Tip

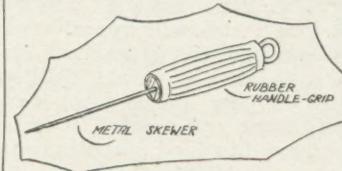
WHEN making the Coronation Chair from Hobbies Design you can round the edges off the four lions to give a more realistic effect. Also, if desired, the chair can be gilded and the lions metal colour.—(C. Tame).

Cleaning a File

FOR those people who have files to clean and do not wish to go to the bother of boiling them in soda, etc., here is a very good substitute. Obtain a wire brush with short bristles and brush up and down smartly, it will be found that this cleans the file very quickly and well.—(B. Irving).

For Pokerwork

BORE a hole through a piece of round wood about 1in. diam. and 3ins. long and push a metal skewer through it. Now



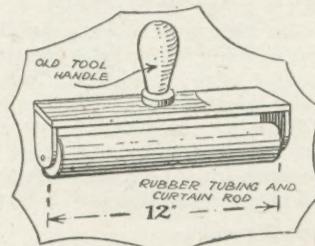
put a rubber handle-grip over the wood and this will be a useful tool to those who do pokerwork on calendars.—(C. White).

Shaping Masts

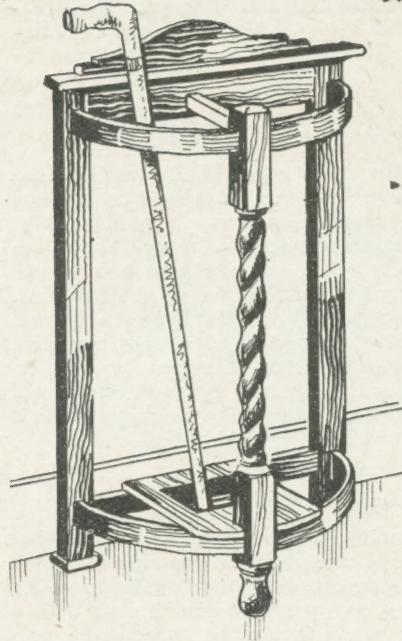
WHEN making model galleons you have a difficulty in making the mast taper, here is a good idea. Fix your plane in the vice upside down and draw your dowelling across. This gives you a neat and finished job, but must be undertaken with care or you will cut your fingers.—(W. M. Wallace).

Wallpapering Roller

APAINTER'S or paperhanger's brush is often expensive to buy if it is to be used only once or twice. A good substitute is to buy one of those large rubber rollers, such as used for a duplicator, at a stationer's. These



are quite cheap and are far handier for smoothing the paper than a brush. Or a good roller can be made as shown in sketch by slipping on an old inner tube of a bicycle tyre on to a 2in. curtain rod and making a handle as shown.—(L. Stanley).



A PRACTICAL UMBRELLA STAND

THREE is a sensible little stand that does not take up much space, has no dangerous corners to knock against, and above all is cheap and easy to make.

Our sketch gives a good idea of the shape and size of the stand which has a semi-circular front—a rather unusual feature and a neat twisted leg which adds character.

Oak would be the proper wood from which to make up the stand and it might be finished either stained and varnished or just left in the plain wood with a rubbing of linseed oil to tone it down.

It stands 32ins. high overall, is 20ins. wide and has a projection of 10ins. There is work for the fretsaw to do in its make-up while the simple lap joints can be made with tenon saw and chisel.

The Back Frame

The main back frame of the stand should first be made. A glance at Fig. 1 shows its proportions and the four rails which make it up. The two side rails (A) are cut square to length and sinkings formed at the tops and near the bottoms to the

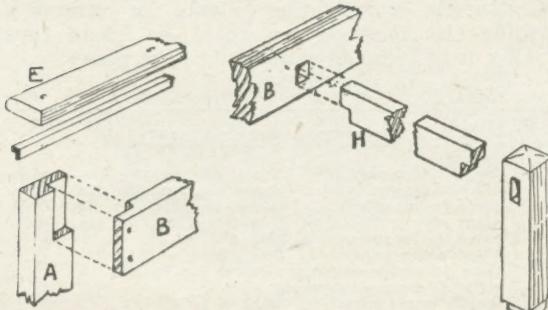


Fig. 2—A back view at the top rail

Fig. 4—The top cross rail with joints

measurements given in Fig. 1. The detail at Fig. 2 shows a back view of one rail with the top rail (B) cut ready for gluing and screwing into it. The width of the halving should be $\frac{1}{2}$ in., which allows ample space for the insertion of two countersunk screws.

The lower rail (C) also extends into the side rails $\frac{1}{2}$ in. at each end. The halvings in this case measure $1\frac{1}{4}$ ins. long by $\frac{1}{2}$ in. wide. The tenons on the ends of the rails (B) and (C) can be cut down with a fine-tooth tenon saw, while the recesses to receive them can be easily chiselled out.

Upright Joints

In each upright (A) there will also be cut two open slots or mortises to receive the ends of the curved rails. The proper positions for these slots are clearly shown in Fig. 1. The slots measure $1\frac{1}{4}$ ins. by $\frac{1}{2}$ in.

In the centre of rail (B) there must be cut a mortise to take the end of the cross rail (H); this mortise measures $\frac{3}{4}$ in. square. Lay all four rails in place, and test for squareness before actually gluing and screwing them together.

Capping Pieces

Along the top of rail (B) there is fixed a capping piece (E). This is rounded on the front edge and on the two return end edges. In fixing this, allow the back edge to project $\frac{1}{2}$ in. over rail (B).

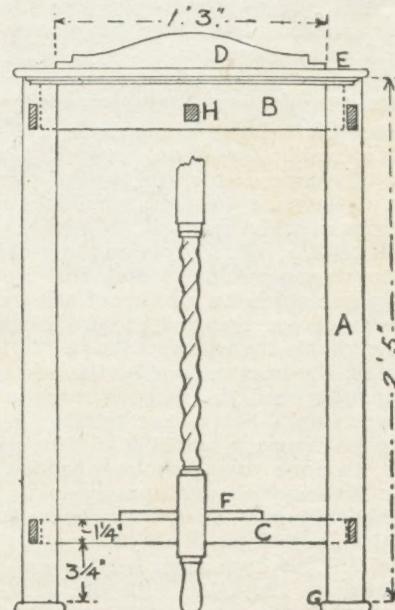


Fig. 1—Front elevation with dimensions

Then under the front edge glue in and pin a piece of moulding No. 307 in Hobbies list.

The ends of this require shaping to the profile as in Fig. 1. The pediment rail (D) is cut to the simple shape shown with the fretsaw and is glued on and screwed with countersunk screws at the ends after the stand itself has been further completed.

The four shaped rails forming the front of the stand are made from flat pieces, as the diagrams show at the bottom of Fig. 3.

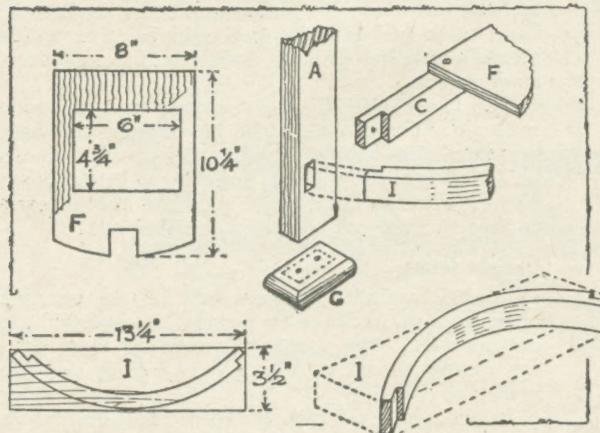


Fig. 3—Details of construction and parts

A coarse fretsaw will do the necessary shaping, and glasspaper will smooth all surfaces ready for finishing. Test the tenons at the ends of the rails in the slots of rails (A) and see they meet at the front exactly at the centre, the tenons here being made to fit into the twist leg.

The leg is Hobbies No. 516B, and the top must be cut off square and afterwards shaped as in detail Fig. 4. This diagram also shows how rail H is fixed and how one of the side slots is cut to receive the curved front rails.

Toy Accordion—(Continued from opposite page)

with fancy doll's house paper such as No. 159, which is a combination of gold on red. The other case could be covered, too. Incidentally, sufficient overlap at the sides and ends should be allowed for covering over the bellows.

To make the bellows, obtain two sheets of strong brown paper roins. by 8ins. and cover with No. 164 paper which is a mixture of blue on white. Reverse the sheets, then rule off $\frac{1}{2}$ in. lines lengthwise, then divide the width as shown at Fig. 5.

Crease at the lines as seen by the end wriggle, then carefully bend the wriggles running downwards and snip V-cuts where shown. Fold the sheets to make corners as at Fig. 6, then glue both together to form the complete bellows, there being an 1in. overlap for this purpose.

To make the corners neat, it may be necessary to indent them a trifle as in the illustration with a penknife. When dry, crush the bellows concertina-fashion on the table with the edge of the palms, then glue the ends to the cases and cover with the overlap provided.

The board to take the metal drip pan (No. 6144) is shown at F in Fig. 3. Mark this out carefully and cut in a $1\frac{1}{2}$ in. square recess in the front to take the leg.

Clean and Screw

Glasspaper the sharp edges of the wood before screwing in place, and see that the opening has been cut large enough to take the pan comfortably. Run three countersunk screws through this piece (F) into rail (C), and also put two screws in the front to make all secure at this point.

The two feet (G) are simple pieces of wood cut oblong and with the edges rounded. Two screws each fix these to the rails A. The diagram at the top right of Fig. 3 will be useful in showing the junctions of rails C and I with the upright rail A.

Suitable Legs and Wood

The cutting list gives the lengths and other dimensions necessary for ordering the wood and making up the stand. The twist leg and the drop pan also can be sent with a parcel of wood or can be purchased separately. The leg costs 9d. carriage extra, and the drip pan (No. 6144) 1/- Stain and varnish and linseed oil in bottles can be got from Hobbies all ready for applying to the wood.

CUTTING LIST

- A—2 pieces 29ins. long by 2ins. wide by $\frac{1}{8}$ in. thick.
- B—1 piece 17ins. long by 3ins. wide by $\frac{1}{8}$ in. thick.
- C—1 piece 17ins. long by 1ins. wide by $\frac{1}{8}$ in. thick.
- D—1 piece 15ins. long by 2ins. wide by $\frac{1}{8}$ in. thick.
- E—1 piece 20ins. long by 1ins. wide by $\frac{1}{8}$ in. thick.
- F—1 piece 10 $\frac{1}{2}$ ins. long by 8ins. wide by $\frac{1}{8}$ in. thick.
- *G—2 pieces 3ins. long by 1 $\frac{1}{2}$ ins. wide by $\frac{1}{8}$ in. thick.
- H—1 piece 9ins. long by 1 $\frac{1}{2}$ ins. wide by $\frac{1}{8}$ in. thick.
- I—4 pieces 13ins. long by 3 $\frac{1}{2}$ ins. wide by 1 $\frac{1}{2}$ ins. thick.
- 1 twist leg No. 516B, 9d.
- 1 piece No. 307 moulding, 19ins. long.
- * Use waste from interior of piece F.

The key head cover detailed at Fig. 7 is made from $\frac{1}{8}$ in. square strips and $\frac{1}{8}$ in. plywood. Nail it together and cover with fancy paper or paint it before gluing in position. The bass incision is treated similarly.

The shoulder and left-hand straps are lengths of leatherette upholstering edging or strapping, while the thumb strap could be broad tape. Affix with celluloid-covered drawing pins.

MATERIALS REQUIRED

1 length stripwood.	9ins. by $\frac{1}{8}$ in. by $\frac{1}{8}$ in. thick.
1 piece fretwood.	6ins. by 7ins. by $\frac{1}{8}$ in. thick.
1 piece fretwood.	3 $\frac{1}{2}$ ins. by 2 $\frac{1}{2}$ ins. by $\frac{1}{8}$ in. thick.
1 piece plywood.	12ins. by 9ins. by $\frac{1}{8}$ in. thick.
1 sheet doll's paper.	No. 164.
1 sheet doll's paper.	No. 159.
1 piece $\frac{1}{2}$ -round moulding.	6ins. by $\frac{1}{8}$ in. by $\frac{1}{8}$ in.
7 celluloid covered drawing pins.	
1 length brass wire.	4ins.
1 mouth organ plate.	
Some tin, leatherette strapping, etc.	

TOY MODEL ACCORDION

MINIATURE accordions can be purchased in the shops from 6d. to 8/- or so. The one illustrated resembles the latter, and while an interesting thing to construct, only costs about 1/6. This price includes a 6d. mouth organ, one of the reed plates of which is used in the toy, same having a scale of $1\frac{1}{2}$ octaves or 12 notes altogether.

There are thus no sharps or flats. The black "keys" are merely painted on the white keys, while the bass notes are nothing more than four celluloid-covered drawing pins. The result, nevertheless, is sure to please any child who, after a little practice, will be able to play almost any popular melody.

The Casing Parts

Before making the end cases, obtain a "World Master" mouth organ from the 6d. stores, the design suiting this particular make. Remove the tin cover and reed plate carefully, then cut an aperture plate (from $\frac{1}{8}$ in. plywood or card) in conjunction with the reeds and sizes given at Fig. 1.

From $\frac{1}{8}$ in. plywood, cut a front and back $6\frac{1}{2}$ ins. by $3\frac{1}{2}$ ins. The front is a plain rectangle with six $\frac{1}{4}$ in. air holes, while the back must be shaped at one edge to suit the bass button plate (see Fig. 2 which combines end views of both cases).

Make case frames from $\frac{1}{8}$ in. fretwood the size of the ends. Check one of the sides (for the bass) with a tenon saw and fretsaw as shown below. Having assembled the frames to their respective ends, attach the button plate, this measuring 4ins. by $\frac{1}{8}$ in. by $\frac{1}{8}$ in.

To ascertain the position of the six holes, reverse the reed plate and mark its position with pencil as indicated by the dotted lines. Having

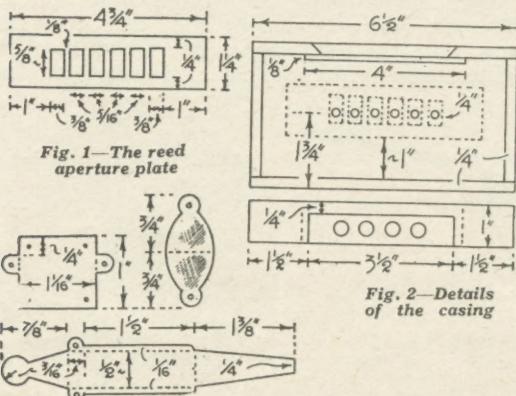
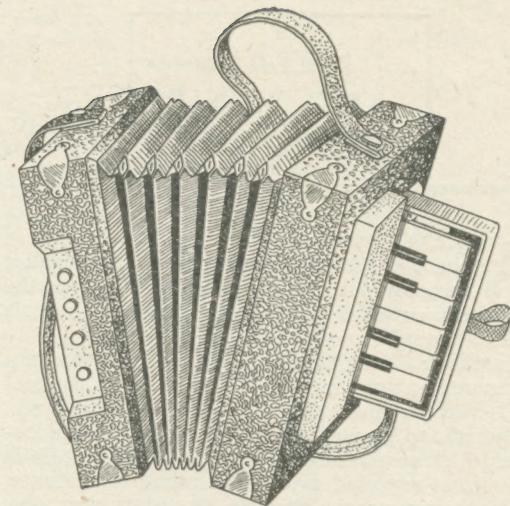


Fig. 3—The tin parts wanted



the holes cut or bored, nail the organ plate to the wooden one and glue to the inside to the approximate position indicated. Note that the lowest notes are to the left.

The Tin Keys

At this juncture, prepare the keyboard. This is a piece of $\frac{1}{4}$ in. stuff $3\frac{3}{4}$ ins. by $2\frac{1}{4}$ ins., edged with $\frac{1}{2}$ in. wide by $\frac{1}{8}$ in. thick strips having rounded top edges. Glue a length of $\frac{1}{4}$ -round moulding underneath the "open" side of the tray, then polish or enamel the whole black or green.

Cut out the tin parts shown at Fig. 3. You will require six keys, eight corner bands and two pivot plates. Bend the keys and plates as in Fig. 4. The plates are nailed $1\frac{1}{16}$ in. apart on the keyboard. The painted keys (enamelled white all over before painting black keys) are, when dry, pivoted between same with a length of $1\frac{1}{16}$ in. wire. The key heads are padded with discs of soft cardboard.

Fancy Covering

Prior to screwing and gluing the keyboard to the right-hand case front as seen by the section at Fig. 4, cover the casing on the face, sides and ends

(Continued on opposite page)

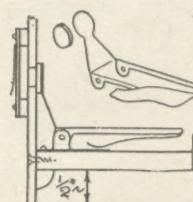


Fig. 4—How to bend the keys

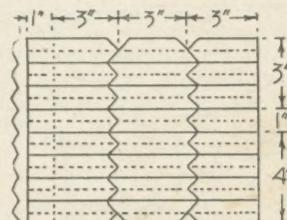


Fig. 5—How to crease bellows



Fig. 6—A corner bellows fold

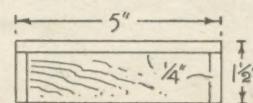


Fig. 7—Size of key head cover

METALS AND THEIR COMPOUNDS



A GLANCE through the contents list of a chemistry outfit conveys a rather peculiar fact, namely, that in almost every case the chemicals supplied are combinations of metals with other substances.

Just look. You have potassium nitrate, sodium carbonate, magnesium carbonate, calcium carbonate, iron sulphate, copper sulphate, etc., etc. Although, to professional scientists, the classification of elements into metals and non-metals is sometimes regarded as being of minor importance, to the amateur the fact is an interesting one, because he is familiar with metals and there is always more satisfaction in dealing with something with which one is acquainted rather than with substances which are comparatively unknown.

We will therefore make a systematic survey of these metals and their compounds, picking on the more interesting facts of each and combining an increase of our general and chemical knowledge with the performance of some interesting experiments.

Notes on Iron

We must commence with iron, simply because it is generally regarded as the most common of all metals, and it is also one of the metals which occur naturally by themselves as well as in combination with other substances, though it is not, in fact, particularly plentiful in this native state.

Those of you who are interested in out-of-the-way facts may like to know that the largest mass of native iron ever discovered was found on Disko Island, Greenland, and weighed about 25 tons. You guess correctly if you conclude that this was a meteorite, for really pure native iron is found only in these fascinating bodies which reach our earth after journeying thousands of miles through space.

Ores and Origin

It is rather surprising to learn that this metal,

when pure is far too soft to be of any material use. Many and varied are the processes which man has evolved in order to make this metal one of the most useful materials in existence.

The most abundant sources of iron are the various ores, which are mostly oxides or sulphides, scattered throughout the countries of the world. The most important are as follows :—

Magnetite or magnetic ore, found in North America and northern Europe. This ore contains nearly 75% of iron.

Red Haematite and Brown Haematite, both of which are found in this country.

Specular iron ore, or ferric oxide, found in Russia, Spain and America.

Ferroso carbonate or spathic iron ore; the several ores which occur intimately mixed with clay; and the well-known iron pyrites.

A Common Green Crystal

Mention of pyrites brings us to that extremely well-known chemical compound, sulphate of iron, also known as green vitriol or copperas. These green crystals come second only in general familiarity to the brilliant royal blue crystals of copper sulphate, of which more anon.

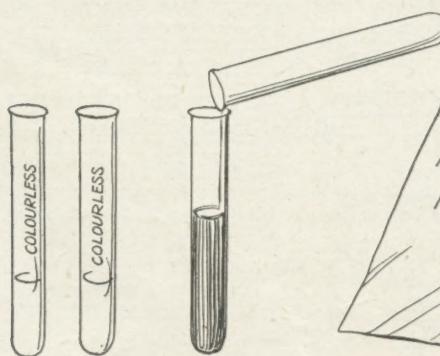
Ferroso sulphate is made in large quantities by exposing iron pyrites to the combined action of air and moisture and treating the product with scrap iron; or, alternatively, it can be prepared by dissolving iron in sulphuric acid.

Ferroso chloride is a very soluble green salt which is deposited from solutions of iron in hydrochloric acid.

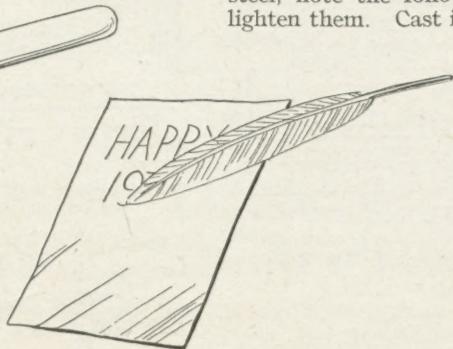
Ferroso iodide is also a pale green salt which is made by digesting iodine and iron with water and evaporating the solution.

Wrought and Cast Iron

Since many people are still ignorant of the difference between wrought iron, cast iron, and steel, note the following and you can then enlighten them. Cast iron contains carbon, colicon,



Two colourless liquids make black



"Invisible writing" in which iron sulphate is used



Section of a typical meteorite

sulphur and phosphorus, and is brittle ; wrought iron is practically devoid of these substances, and is malleable ; steel is actually a form of iron which contains more carbon than wrought iron but not so much as cast iron.

A word about rust. As everyone who has dabbled in chemistry knows, rusting is the simple everyday term for the quite marvellous natural chemical process which consists of the combining of iron with the moisture of the air ; if the air is perfectly dry, rust will not be formed.

And now we are brought face to face with one of those ever-present natural laws which are so fascinating, and so permanent. If iron is left lying about it eventually, and inevitably, returns to rust, or one could even say, to dust.

Statisticians have said that a quarter of the world's supply returns to rust every year. And yet man is daily striving to prevent this cycle from being completed by coating all important ironwork with paint which is itself made from oxide of iron ! Most of the world's great bridges have a staff of painters permanently engaged upon

them, for some of these vast and intricate structures take as long as three years to paint properly, and by then it is time for the men to go back and start at the beginning again.

In truth, man has not yet made himself the master of nature.

A Simple Experiment

It is in connection with the changing colours of liquids that you can make use of your iron sulphate crystals. Make up a solution by dissolving several of the crystals in water, and make a similar solution of powdered galls, a dirty-looking brownish-white powder which is very cheap to buy.

This latter must stand for a day before being filtered. Both these solutions will be almost colourless, but when mixed the resultant liquid is black.

Keep a little of the iron sulphate solution, write a note by using this liquid and a clean quill pen. When it has dried the letters will be invisible, but if you brush it over with a solution of potassium prussiate, the writing will reappear in a beautiful blue colour.

THE WHEEL OF LIFE NOVELTY

THE "wheel of life" or zeotrope, as it is called, is an interesting optical toy which can be made cheaply and easily from cardboard and wire.

It consists mainly of two cardboard discs, one being slotted and inked black, with the other having a series of "pin men" that dance or walk according to the progressive way in which they have been drawn.

There are usually from 12 to 16 slots and the same amount of progressive men. Each man faces a slot, and when the discs are arranged on a suitable wire axle and trunnion (or fork) and revolved slowly via the axle end, the men are seen to come to life and go through their performance in a novel manner.

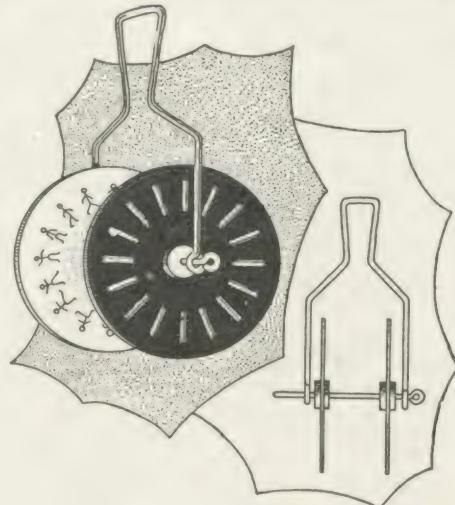
The Discs

To make the discs, first scribe two 3in. circles on thin card. A post-card would do. Now set the compasses to $\frac{1}{4}$ in. and mark that radius on one disc, then reduce the radius by $\frac{1}{2}$ in. and mark that circle.

The disc is accurately divided to give 16 slots $\frac{1}{2}$ in. long by about $3\frac{1}{2}$ in. wide.

The Slots

Cut the slots out carefully with a penknife or razor blade. Having blackened the disc all over with Indian ink, let it dry flat, then set it over the white disc and pencil the slot positions on same. The pin men are drawn in black ink over the pencil marks, each figure to show a slightly different



movement (just like cinematograph film) to give animation.

It is imperative that the men are exactly drawn in the centre of the pencil lines, particularly the body and head. Other forms are comical faces which laugh, grin, wink eyes and wriggle ears, a flower growing, a man bowing or going through exercises and anything you like within reason.

Wire Handle

The wire for the axle and fork should be about 19-gauge or that found around boxes. The washers should be cut from fairly stiff cardboard and glued on each side of the discs to keep them firm. The discs should not be loose on the axle.

If the slotted disc is loose, however, you can, by twisting the axle quickly in one direction, then twisting it the opposite way, see a curious behaviour on part of the men.



FRETWORK

The second of a short new series of hints on little matters which arise from time to time.

WE were talking in our last article of two or three points to remember in gluing work.

The ordinary Hobbies glue in tubes is quite sufficient for the ordinary use, of course, because a great quantity is not required.

If a larger amount of work is being undertaken at once, however, it is advisable to have a larger quantity which is usually obtainable in tins from $\frac{1}{2}$ lb. to 1 lb. and more. In this form, the glue is usually more solidified, but it can be made soft by standing the tin in a cup of water.

In dealing with larger surfaces, too, a brush is useful. Get a stiff-haired one, more the bristle type, and paint it on evenly but still thinly. Of course, in cabinet works and large carpentry shops, the Scotch glue is still in use.

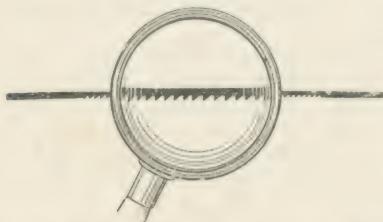
Glue Ground or in Cakes

This is another form of adhesive because the glue itself is sold in a solid cake. It is really a flat slab—called a cake—which has to be ground up into smaller pieces then put into the inner receptacle of the special glue kettle. The outer receptacle is filled with water and the whole thing stood on a gas ring so it can be brought up to the boil. You can also buy glue ready ground and all is sold by weight.

The glue needs stirring, and is not used until all lumps have dissolved. It is, of course, very strong, but is not so clean nor so colourless as the ordinary tube glue which is usually sufficient for our purpose in fretwork.

Why Sawblades Break

Now to come to another point in fretcutting, which very often worries the beginner. That is the fact that the sawblade snaps with what appears to be comparative ease. We say "comparative"



because this is not actually the case, and when you have got more used to handling the work and the fretsaw frame, you will be amazed at the amount of cutting which one kind of sawblade can undertake.

It is largely a question that the beginner uses either too much force, or else does not hold the work down to the table. In consequence, the wood jumps up and the saw cannot stand the

sudden angular jerk and consequently snaps. These tiny blades are made from a special brand of steel. They pass through half a dozen processes before they are finally inspected and checked out as O.K. in Hobbies factory.

Indeed, the grinding, tempering, grading, etc., is a fascinating process for all visitors to our factory. They are amazed at the rapidity and accuracy of the machinery which turns these splendid little blades out in thousands.

GLUE — FRETSAWS SCREWS AND NAILS

Naturally, the teeth of a fretsaw blade are not sharpened in the way of an ordinary handsaw, but are so set and shaped that they cut quite easily through wood up to as much as $\frac{1}{8}$ in. thick.

Two Cutting Points to Remember

There are two principal points which the beginner must learn to overcome. One is that he does not fit the blade into his frame sufficiently taut, and the other is that he pushes it into the wood with a jerky motion and so snaps it.

The special shackles which have been evolved by Hobbies, will hold the tiny end of the sawblade in a vice-like grip so the frame itself should be sprung as much as possible to make the tension high. About $\frac{1}{8}$ in. of the blade should be inserted into each screw and shackle, which is then turned up tight to prevent slipping.

Maintain an Even Stroke

Remember, too, that the cutting is done on the down stroke, and this is the one which should be even and smooth. It is no use forcing the saw into the wood and trying to gash your way through. Maintain an even up and down stroke like the piston of an engine, gradually feeding the saw on to the wood, and not forcing it too much. Then by holding the wood firmly to the table, you can proceed without snapping the blades unnecessarily.

One other trouble is that blades are apt to be broken by the beginner when he first learns to turn corners. As can be seen in the magnified picture of the sawblade here, the teeth all point one way, and the width of the blade is greater than its thickness.

If the blade was cut from square section steel, then you could turn it round in its own length. But obviously as this is not the case you must

work the blade round gradually to allow for the width to turn.

When you go down a straight line, the cut is very thin, then when you want to turn a corner you have to make a slightly larger hole for the blade to turn in. This is done by still keeping a steady up and down stroke, and at the same time turning either the work or the saw or both gradually.

The user of the machine in this operation always has the advantage because he can treadle quicker to turn a corner quickly, and at the same time has both hands free to operate the wood.

It is no use trying to turn the work, remember, unless the saw is going up and down fairly rapidly. It is surprising, however, how soon one gets used to turning even sharp corners.

Sawblade Grades

Do not forget, too, that sawblades are obtainable in various grades, and the keen worker will have two or three of them handy. Why waste time, labour and blades by using a fine grade saw on fairly thick wood? Surely it is more common sense to obtain a coarser blade and do the same work much more quickly.

Actually the number of teeth on these blades vary according to the grade and the actual thickness of the steel varies also. In consequence, for coarse work the coarsest blade is good enough.

The finest grades start with size 00 and then go up to No. 6, which is the coarsest.

Metal Cutting Saws

By the way, those who like to cut little overlays or ornaments in metal, must not forget that metal cutting saws are available for this purpose. They have very much tinier and more numerous teeth, but are quite effective on sheet metal of all kinds.

That is a point the worker should bear in mind, because very often a box or a cabinet, or other piece of work can be made much more striking by the addition of a simple ornamental piece of work in zinc or aluminium, brass or copper.

Examples of Metal Work

Use of the fretsaw is obvious on other occasions in metal when keyhole covers are wanted, or you will want to add a little ornamental shield to a larger wooden challenge shield, or of course, you can even cut out monograms and initials in metal in this way.

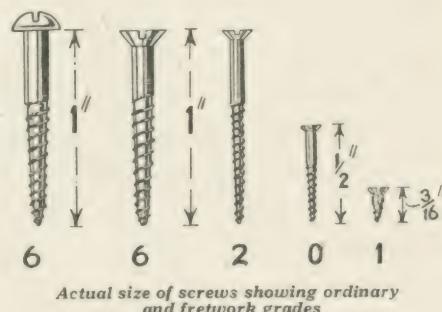
If you cannot mark the actual design on to the metal, then trace it out on to paper and paste this down to a piece of wood. Then nail the metal either under the single piece of wood, or between two thin pieces, and cut out in the ordinary way. The metal ornament, of course, must be added to the work by means of tiny fretnails or screws.

Mention of screws reminds us of one or two points which the worker may not already know, but which are worth bearing in mind. Those he needs are very much thinner in the shank than the ordinary screw used in ironmongery, and the illustration herewith shows the difference.

Screws, of course, vary in length and each length can be obtained in a wide variety of diameters. This diameter is of the shank itself, and a standard number is given to all these. The illustration herewith is actual size, and illustrates the point clearly.

The ones most used by the fretworker are size 0 or 1, whereas the carpentry screws are 10, 12, 14, etc. The screws for the fretworker are obtainable in brass or iron, but in either case it is essential to bore a hole to start them off into the wood.

If, too, you are using a long screw, say a 1 in. one, which has to be driven into hard wood, use



iron if you can, because the brass headed ones are more likely to twist off and break.

Do Not Force Them

Remember, too, in using these screws that there should be no need to force them home by heavy pressure with the driver. If you make a starting hole with a gimlet or awl, and stand the screw into it, you should be able to turn the screw home comfortably with very little pressure.

The screw actually cuts its way into the wood, and you are giving yourself unnecessary trouble by pressing it down into the board.

Round and Flat Heads

The two kinds of screws in use are the flat headed ones and round headed ones. The former are used when they will not be seen, but on any frontal work the round headed are advisable. Remember, however, that the latter are a little more difficult to turn home, and you must have a very thin screwdriver for the purpose. The difference is shown in the drawing also.

The round headed one stands with its head flat on to the wood, whereas the flat headed one sinks into the board so the top is flush with the surface. This means a difference in the overall length of the screw, but the measurement is always taken from the points shown in the drawing herewith.

In ordering screws give the size of shank as well as the actual length. For instance, you may require a $\frac{1}{2}$ in. No. 2, or a 1 in. No. 6. It is not sufficient just to give the length only.

You should also state whether flat or round heads are required, and whether in brass or iron.

(To be continued)

THE PUPPET SHOW

THREE are many ways of making and working Marionettes or String-Puppets as they are sometimes called. The method described below was designed, primarily, to combine with an adaption of the Theatre used for the Glove Puppets. This adaption is necessary, since the string Puppets are controlled from above.

Our stage has an effective height of about 1 ft. 2 ins. and therefore the Puppets must average 7 ins. in height—from top of head to foot.

Of course, this method could be used for making the larger Puppets, providing you were prepared to build a special stage to accommodate them. You will appreciate that with the small Puppets, considering the 'joints' required, quite a fair amount of skill is needed, especially as the whole thing is carried out in stout wire.

Suitable Wire

Some practice with a pair of sharp-nosed pliers on stout wire will very soon make you proficient, however, in the fashioning of neat loops; a glance at Fig. 1 will give you the type of loop required.

The wire used in the making of the Puppets must be pliable for easy working, but should at the same time be sufficiently stout to retain its shape when the job is finished. The use of wire which is too thick will result in bulky joints and for this reason should be avoided.

Having selected the wire, the parts of the frame (see Fig. 1) should be shaped carefully. Make the loops as neat as possible, so there is no 'catching' where the end of the loop meets the straight piece of wire.

Assembly Complete

The lengths given in Fig. 1 are the straight lengths. The loops, being extra, should be allowed for when cutting the wire. When all the parts of the frame are completed they should be assembled according to Fig. 2, and the joints tested for easy working. Lubricate the joints with vaseline.

In joining, the loops should never be prised open, but opened by twisting sideways while gripping the 'straight' with a second pair of pliers. The parts to be soldered are indicated by the letter S in Fig. 2. Bear in mind that all parts to be soldered must be scrupulously clean, even free

from finger-marks, before attempting to solder. The 'hip-joint' calls for a certain degree of skill, but is not beyond the powers of the average handyman.

The hands are simply small flattened oval shapes of lead, while the feet are pieces of lead in the form of boots. These are made in the following way.

MAKING & WORKING MARIONETTES

Remove the hand and foot wires at the 'wrists' and 'ankles,' and very slightly turn up the extremities. Prepare a mould, in fine damp sand, of a simple boot-shape, and, holding a foot-wire in position with a pair of pliers, pour in the requisite amount of lead (molten). The lead may be melted in a tin-lid, the edge of which has been pinched to form a fine spout.

The procedure is repeated for the other foot and then after making a hand mould, the hand wires are treated similarly. The feet and hands are then replaced, securing by twisting the loops back into place.

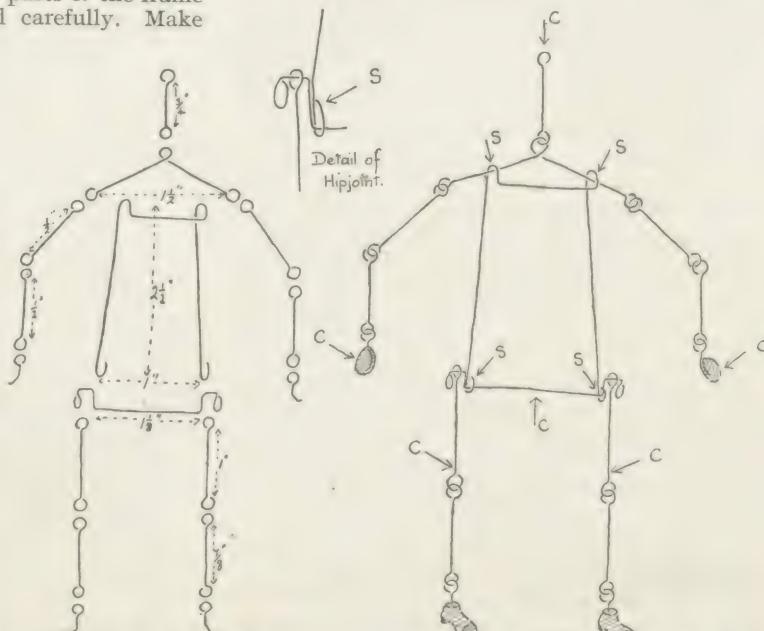


Fig. 1—Dimensions of the wires

Fig. 2—The control points (C) and soldered joints (S)

The control 'wires' are fixed at this stage and considering the small size of our Puppets, a good strong black linen thread will be sufficient. The arm strings are secured round the hands while the leg strings are fastened to the thighs just above the knees.

Some Further Controls

At this stage it is convenient to paint the hands and feet with suitable colours. Further controls are fitted as follows :—

- (1) The head string is fastened to the head loop.
- (2) The body is secured to the lower cross-piece of the body framework.

The knot of each string where it is fastened to the Puppet should be given a blob of Hobbies' Glue in order to prevent slipping.

The 'doll' is now filled out by binding with tape in the following way.

Glue the head-wire (using tube glue as above) and wrap with $\frac{1}{2}$ in. tape giving dabs of glue occasionally. Continue this wrapping until you have fashioned a suitable 'core' for the head, securing the end of the tape with glue.

For the body, after gluing the two side wires, a large cork coated with glue is placed between them and the whole bound with tape, dabbed occasionally with glue.

Body and Limbs

The arms are not filled out in any way but the legs are bound with tape as before, between the hip and knee joints and between the knee and

ankle joints. In this way the thighs and calves are made.

The face is made in the same way as was described for the making of the heads of the glove puppets. The modelling of the features and neck is carried out in plasticine. Successive coats of paste and crêpe paper are then applied to the head, face and neck until there are four layers of paper well pressed into the features.

Colouring the Head

At this stage the head should be left to dry and by that time it will be quite hard and ready for colouring. In fact the head should not be painted until it is 'bone dry.' The colouring is best carried out with Crusoe Enamel but water-colours or Poster-paints may be used if a finishing coat of varnish is given.

The head-dress or 'hair' is fitted at this stage and after dressing, the doll is ready for the controlling strings to be arranged in some workable form. The control strings should penetrate the clothing where this gets in the way. Simply pierce the clothing with a needle threaded with the control string concerned.

The strings requiring this consideration are—the leg strings—the body string and the head string which must penetrate the headgear.

The arrangement of the control strings and the adaption of the Puppet Theatre will be dealt with in the next article.

(To be Continued).

HOBBIES LEAGUE CORRESPONDENCE CLUB

These Members of Hobbies League would like to get in touch with other readers and so form pen friendships which will undoubtedly prove interesting to all. In this way, one has a wide circle of friends and increased knowledge in people and places, not only in one's own country, but all over the world. Members should write direct to the addresses given, stating their full address and age, adding any hobbies in which they are interested. Hundreds of members have already taken advantage of this Correspondence Club in this way and others who wish to do so should notify the Registrar with the necessary particulars

NAME	ADDRESS	WANTS FRIENDS	INTERESTS, Etc.
Owen O. Uzoigwe.	N.A. Office, Awka, Onitsha Province, Nigeria, W. Africa. 899-H, Simon Rd., Singapore, S.S.	England.	Anything, especially Stamp Collecting, Music and Games. Photography.
A. L. McIntyre.	1, Harwood Ave., Mitcham, Surrey.	Girls or Boys all over the world. Anywhere.	Fretwork and Collecting Cig. Cards. Stamp Collecting.
F. E. Morton.	356, Station Rd., P.O. Green Wood Park, Durban, Natal, S. Africa.	Anywhere (Girls only from India). Anywhere Abroad.	Stamps, Sports and Photographs.
R. T. Govender.	83, Ravenshaw St., West Hampstead, London, N.W.6. c/o S.C.O.A., Umuahia, Nigeria.	Egypt, India and Europe. Boys and Girls from 21 yrs. Anywhere.	Anything.
G. J. Hall.	c/o A. O. Ogbogu, Loco Running Shed, N.E. Rly., Enugu, Nigeria. Govt. College, Umuahia, Nigeria.	Anywhere.	Picture Painting, Stamps, Carving, Newspapers, Photography.
I. M. Okoso.	The Dennis Memorial Grammar School, P.O. Box 58, Onitsha, Nigeria. Govt. School, Ajalli Town, Awka Dist., Onitsha, Province, Nigeria, W. Africa.	Anywhere.	Anything.
C. O. Ikeme.	Govt. School, Awka, via Onitsha Prov., S. Nigeria, W.C.A.	Anywhere.	Stamps.
E. D. Green.	215, Wineva Ave., Toronto, Ontario, Canada.	Anywhere.	Anything.
S. A. Ume.	Catholic School, Eke via Enugu, S. Nigeria. 55, Heeren St., Malacca, S.S.	Anywhere.	Fretwork, Stamps, Coins.
A. N. Chikwemdu.	65, Church St., Maritzburg, Natal, S. Africa.	Anywhere, especially British Empire.	Stamps, particularly Coronation.
J. N. Otti.	119, Church Rd., Ferozepore Cantt., India.	Island of Japan and anywhere else.	Snaps and Stamps.
H. F. Goulston.	29, Glengall Rd., Bexleyheath, Kent.	Anywhere.	Photography and Conjuring.
R. C. Melie.	23a, Kesang Lane, Malacca, S.S.	England.	Anything.
Low Hock Hoon.		Anywhere.	
M. I. Cassimjee.			
Rattan Lall.			
F. J. Wynn.			
Lui Hon Meng.			



Model Railway Accessories



THE construction of special types of rolling stock, to scale, in the smallest standard gauge, using for the purpose tinplate strip and the usual brass components, is not a task that the average amateur need fear. The two important requirements are correct drawings and a tolerable measure of patience.

The photograph herewith shows a model of this type made recently by the writer, which can perhaps claim to have about it the atmosphere of realism and correctness. While it represents no definite individual prototype, it does incorporate standard practice and was constructed from various drawings and photos of actual examples.

The two wheeled units—the machine carriage and the match-truck for bearing the weight of the jib—are made from tinplate strip, obtained all ready cut by machinery. Wheels, axleguards, brake controls, jacks, the cylinders of the crane, buffers, chains, ladders and so forth are all obtainable in finished form commercially.

The Crane

The framework of the crane unit was made from sheet tinplate cut from a tobacco tin, as also was the jib itself, the latter with the aid of $\frac{1}{16}$ in. tinplate strip for the cross-members. The accompanying instructions should serve to guide any painstaking enthusiast to produce such a model.

The general structure of the vehicle may be gathered from the elevation in Fig. 1. The work actually began with the formation from tinplate of the two vehicle bodies.

First, there were cut two pieces for the upper and lower floors of the crane-body. These were about $3\frac{3}{8}$ ins. in length and $1\frac{1}{8}$ ins. wide. They were cut perfectly square with the aid of a tee and scribe, sheared with scissors (the material being not too thick), and then had their edges trimmed absolutely straight by rubbing them on an old, large file of fairly fine calibre.

Next, they were rubbed on the flat, and the side members added by soldering, an electric iron of course being used. The arrangement of these floors is shown in the upper right-hand diagram in Fig. 2.

The side strips were of $\frac{1}{16}$ in. strip, machine cut, from the Leeds Model Co. The top floor was laid on a piece of cardboard on the bench, with a short length of stripwood tacked down to afford a right-

angular guide. Up against the side of the stripwood, resting on the edge of the tinplate floor there was set a length of $1\frac{1}{16}$ in. thick cardboard, in front of which the tinplate strip was firmly held with a small file. The lower edge was then moistened with acid and the joint soldered.

Then the floor was turned and the opposite side-strip soldered on in the same way. There-

BREAKDOWN CRANE IN OO GAUGE



after the lower floor was soldered, this time, necessarily, the soldered seam being on the outside, and afterwards being cleaned off neatly with a file. Two ends were then cut from the strip, slightly wide this time, and soldered in place.

Next, the body of the match truck was similarly made, but with $\frac{1}{16}$ in. strip for the sides. It is important to get all angles absolutely square when doing this work.

Now followed the wheel-frames, which appear so difficult, but are really not so if tackled carefully. The upper diagram to the left in Fig. 2 shows how these were made.

First, two lengths of $\frac{1}{16}$ in. strip were cut for the crane. These were laid edge to edge and the positions of the wheels marked out by perpendicular strokes with a scribe. About these strokes there were then cut small square apertures, $\frac{1}{16}$ in. square, exactly opposite each other, the two strips having been temporarily tacked together with solder on the upper corners to keep them still. These square apertures were then trimmed out with a square file.

When all were done the solder tacking was

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62, THE BENNETT COLLEGE SHEFFIELD

filed off and the pieces separated. The match-truck frames were done in the same way.

Next began the work of fitting the axleguards. In Fig. 1 (C) the method of doing this is indicated. The first guard is taken and laid under the frame-piece, with its journal upwards and the spring tops just showing evenly on the edge of the strip.

Into the journal there is inserted a piece of $\frac{1}{16}$ in. wire, to hold the guard down. The strip is held by one of the fingers and the guard sweated on with the iron through the tinplate. The tinplate should first be lightly tinned, and the back of the guard touched with acid.

Having made up all the four wheel frames, with guards, these were then soldered in place on the body members as shown in Fig. 2 (B). First, one side was set in its place and soldered on the inside; then the wheels were inserted and the other side soldered, this time on the outer side, the solder being filed off neatly.

At each end of the frames an end-piece was then fitted.

These units having been completed, they were then thoroughly tested for running, a lookout being given for any discrepancy or see-sawing, and where this was evident it was at once rectified.

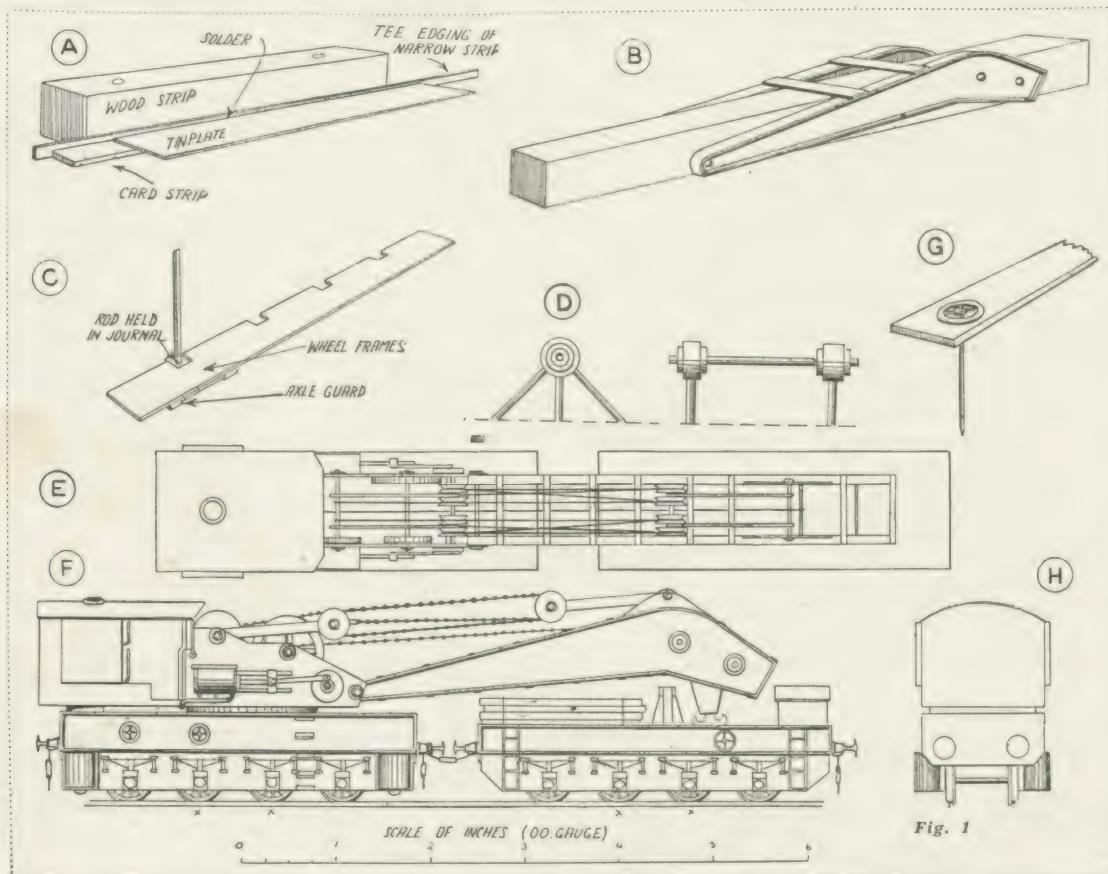


Fig. 1

Great care is necessary in doing this work; the iron must be lifted instantly the first sign of fusion takes place. But it is not difficult work after the first one or two experiments. Get the centre of the journal exactly in the middle of the aperture, and get the guards all precisely the same height on the strip, and exactly even.

If one is done amiss, it can be readily melted off and used again, by simply holding the strip off the bench and laying the iron on the tinplate above the guard; the latter will at once fall off.

It is a good plan to drill out the journals of these guards by finger-twisting in them a $\frac{1}{16}$ in. twist drill. This will ensure very easy running later.

The next job was the jib of the crane. First the two side pieces were cut from an empty tin, the material being not too thick, a cardboard form being used to get the pair exactly true to each other. The necessary holes were then drilled, and the side pieces trimmed up with the large file. The tee-edge was then soldered on all around the sides.

This consisted of $\frac{1}{16}$ in. strip which was soldered to the sides by again using the piece of stripwood and the cardboard insert, soldering on the inside in each case. The joint of the edging should occur at one of the angular corners, not at the rounded end.

(To be continued)

OUR MODEL HANSOM CAB

In our issue of last week, we gave details of the carriage shafts etc., of the model. The painted work can now be set aside while you proceed with the horse and harness, a supplementary design sheet of which, as you know, is obtainable free from the Editor, if 3d. is sent.

Having procured this design sheet, note the direction of the grain of the parts as indicated by the arrows, this being very important. It will be seen, too, that the head and body of the animal (the central part) should be cut from $\frac{1}{2}$ in. fretwood; but owing to the difficulty of negotiating the ordinary fretsaw in this thickness of wood, two identical shapes could be cut separately from $\frac{1}{4}$ in. stuff then glued evenly together.

Having glued the leg pieces to their respective sides on the body, see that the hoofs rest properly on a flat surface. When the glue has thoroughly dried, carve the horse to shape with a penknife, half-round rasp, wood file and glasspaper.

Carving the Horse

To carve with some amount of realism, you should work from a clear photograph or study the horses you see in the streets, noting particularly the rump, haunches, hips, chest, ears, nostrils, neck, shoulders, ankles and other bone projections.

After you have got the breast and neck sides worked away, attach the shoulder patches, same being roughly shaped (as shown by the section) beforehand. Coarse glasspaper (held in the fingers) rubbed into hollows and over humps will even up the work wonderfully. The eyes and



A photograph from the rear, showing cabby's seat

nostrils should be "picked out" with the penknife point and touched up neatly.

Plastic wood pressed against the corners of the legs with the fingers (flush with the belly) will improve their appearance and further strengthen them.

Your model will look "stocky" frontwise, but this cannot be helped, and anyway, the final result isn't at all bad as you can see by one view. Why, you'd just think it was a *real* horse standing there!

Tail and Collar

The tail is very simply made and affixed. Referring to the diagram at Fig. 6, wind about 25 turns of black thread (fine stuff) around the four fingers of the left hand. Cut and tie the looping (1), then bring the loose ends together (2) and wind the thread around to make a runt (3), the end of the thread being glued around.

A suitable hole is then drilled in the rump of the horse (approximately at the backbone) and the tail end inserted with a spot of glue.

The collar, to be exact, should be cut from $\frac{1}{4}$ in. thick boot leather, but fretwood serves just as well. Shape and bevel it as shown by the section, then make an interstice or groove all round the face with the edge of a half-round file.

This is for the annulated wire rigging which is bent to shape from 25-gauge wire.

A small hole is made in the cusp of the collar for the wire tabs. These are inserted and the rest "sprung" into position and, if necessary, the tiny rings pinched together as formally. It should be your aim to make the collar fit neatly around the horse's neck and thus avoid that extremely "wooden" look.

Saddle and Bridle

After the horse and collar has been painted realistically with flat paints (mottled brown or stippled grey for the coat of the horse, with black



A helpful picture of the horse before painting

hoofs), the shaft saddle and headstall could be made and affixed. To attend to the former first, cut out the bridge.

The belly-band and girth band is then cut to shape (this is best judged by the eye) from leatherette as shown and glued around the body of the model.

The rein guide wiring is then attached to the bridge piece which is fitted to the back, after which a length of $\frac{1}{8}$ in. wide leatherette is looped affixed at one side with a shortened pin, then looped at the opposite side, brought under the horse and affixed similarly.

The bridle, which consists of the headstall, bits and reins, is attended to as seen by the elevation at Fig. 1. A detail of the bits is at Fig. 5, H serving to show what they are like prior to inserting (K). The reins can be made from strips of leatherette but owing to the stiffness of this material, you have the alternative of using braided thread, preferably cotton thread.

This is just three strands of ordinary thread plaited together by the loop method and not as a young girl might plait her hair, although this would do if done neatly. The ends of the thread are then tied to the bit rings.

Rein Guide

A short piece of 19-gauge wire makes the picket for the reins on the cab roof behind the trap door.

The wire trunnion or guide (B) is shaped from 15-gauge wire and inserted to a hole in the roof top at the front.

The breeching is shaped from leatherette as shown. Fit the tail piece over the horse's back first, then glue on the breeching. Now back the horse into the shafts and connect the breeching hooks to the eyes on the shafts.

The traces—which are, of course, strips of leatherette—stretch from the collar rig down through the shaft loops to the guard lugs (F), same being bent from pins.

The Base Stand

At this juncture, you start on the final piece of work—the stand. The baseboard itself measures 11ins. by 6ins. by $\frac{1}{4}$ in. A suitable grooved moulding (No. 37) is simply mitred around this to form the edging. After the work has been painted and allowed to dry, coat the top surface with thin glue, then sprinkle it with dry sand.

This gives the appearance of a road. Another method is to use soft clay, same being pressed on and made bumpy with the hands.

When dry, this looks like an old-time highway, especially if an odd pebble is added here and there and a few horse and wheel tracks made with the model (lightly) before the clay hardens. Quite a thin layer is sufficient, remember.

SOME INGENIOUS NOVELTIES

A Makeshift Shower Bath

WE all enjoy and appreciate a refreshing shower bath after tennis or other strenuous games, but it is only in the newest houses that this little luxury is provided.

Here is your opportunity to show how handy you can be. In your garage or some other out-house, screw into the rafter overhead a very strong hook and from this hang a galvanised iron pail into the bottom of which has been soldered a tap fitted with a rose or sprinkler, a hole having been cut in the bottom of the pail to accommodate the tap.

Place a large bath beneath it, and turn on the tap. You will thus have an excellent substance shower bath, and if you wish to add to it by hanging some curtains around it, so much the better.

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IF you keep a few fowls which must be fed at a time when you are not at home to do it, here is a little device which will overcome your difficulty and feed them regularly at a given hour. A small wire trigger rests on the winder of an alarm clock, and also supported by a piece of string, the movable bottom of the upper half of the hopper in which the necessary quantity of grain has been put.

As soon as the proper time comes the alarm goes off, the trigger drops, the trap-door falls, and the food is released.

You may find in time that as fowls are such creatures of habit, they will run to the hopper as soon as the bell rings.

Catch that Mouse Alive-oh !

MICE are often shy of traps especially after they have been used a few times. But it is not difficult to devise fresh traps, and here is one that baffles mice completely.

Take a short piece of disused cycle tyre and insert one end of it in the hole through which the mice come, making sure of course that there is a clear run up the tyre. Stuff up any openings around the tyre, so that the mice must use the rubber gangway.

Now convey the tyre in the form of an arch into the mouth of a large empty glass jar, which once contained pickles or fruit, but now holds nothing more than an exciting bait and the smell of these good things. One end of the tyre is thus in the hole and the other end in the glass jar. By and by the mouse will be tempted to run up the tyre, and will fall into the jar.

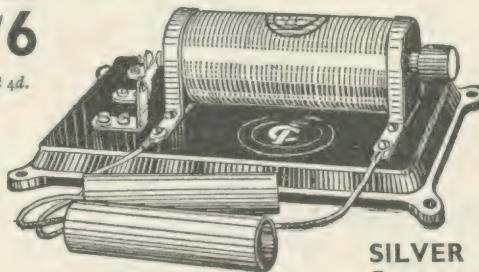
Of course, he will be unable to get back into the tyre, and you will be able to dispose of him, and probably many others in the morning, and set up the trap again for fresh tourists.

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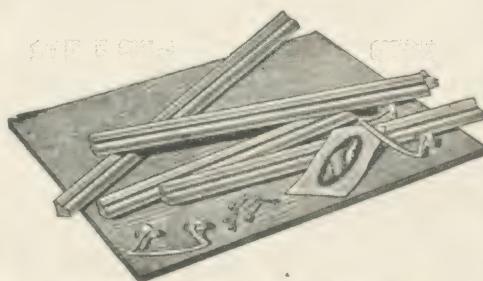
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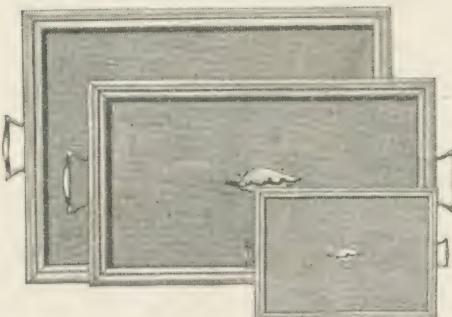
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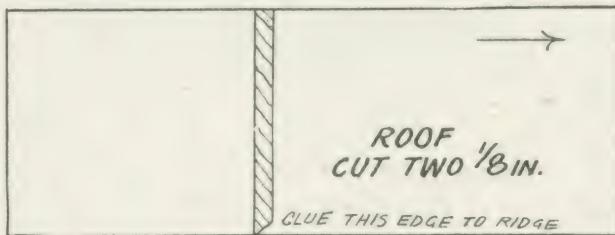


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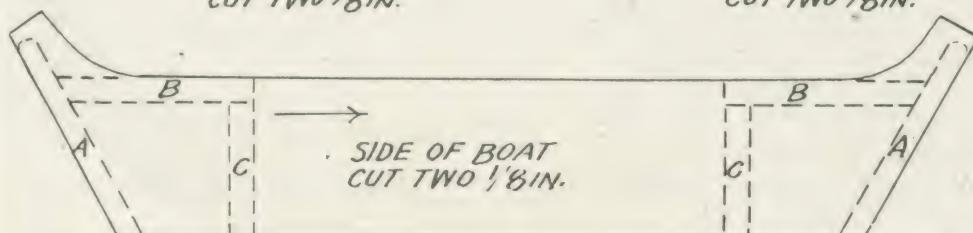
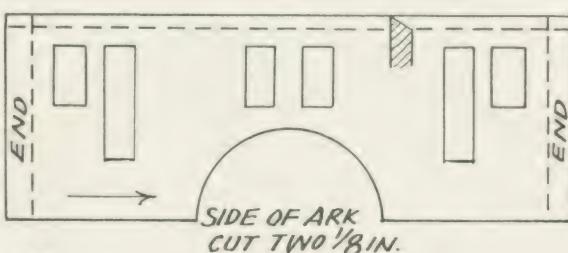
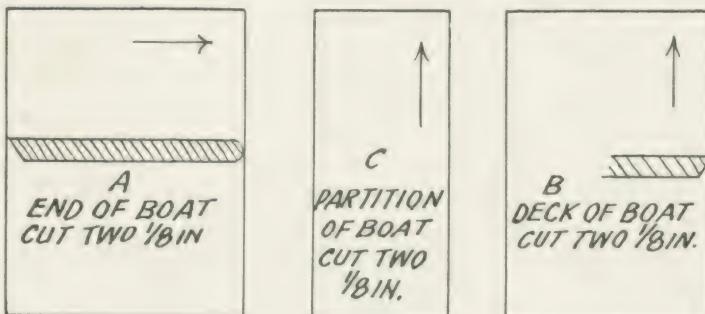
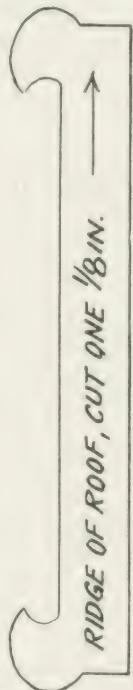
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The EDITOR'S NOTES



I HOPE all who can, who live in or around London will make a point of going to the Science Museum to see a special exhibition devoted to timber. You can learn more there in half an hour than from reading a couple of days—and all of it interesting and helpful. There are models of modern houses in wood, methods of timber seasoning, growth and production as well as testing machines, photographic and illuminated pictures of all kinds. Altogether an exhibition worth a visit by anyone interested, as we are, in all kinds of wood. If you intend going, do not delay your visit too long because the Exhibition closes on February 6th.

* * *

YOU can see the good things in this issue for yourself, but I just want to mention one or two now being prepared for next week. Most of us sometime or other want to see more than we can and delight to study objects of interest under a microscope. Well, here's a chance for everyone, because you can make a practical one from the details and diagrams in next week's issue. It is made quite simply in wood with a platform on which to lay your objects. I can tell you also where to obtain the necessary lens quite cheaply, so there should be no reason why the handyman should not build himself a practical and interesting instrument.

* * *

ANOTHER thing for next week is the list of winners in the Junior Section of the Fretwork Competition which closed last month. There are some interesting remarks too, about the cutting which, I hear, was not quite up to the usual high standard.

* * *

THREE were some bright suggestions in our Scout Telegrams earlier this month, but I don't think the recipients would have been able to understand some of them. Prize awarded and sent to, M. J. Crowther, Littlemoor House, Mirfield, Yorkshire. His effort ran "Hobbies Outfit Bought. Boys in Ecstasy. Superfine Work Executed. Exhibited Kenneth's Lovely Yacht."

OUR friends in Australia will this week be inaugurating the 150th anniversary celebrations which are being held to commemorate the landing of Capt. Phillip who planted the flag for the foundation of Australia on Jan. 26th, 1788. There will be water and land carnivals on a grand scale, and the gala will continue right up to April. In view of the world wide interest we too, must mark such an event and I hope to announce an interesting and appropriate design shortly. Our readers residing in Australia will be as keen on it as other readers who have friends or relations living in that great Continent.

* * *

MENTION of Australia naturally leads us to think of the trees grown there and the timbers which are used. There are numerous varieties of great usefulness and beauty. Australian blackwood is a handsome wood used for panelling in railway carriages, banks, shops, pianos, etc. Then there is Australian or Queensland Walnut, and Black Bean, both used for interior decoration. Jarrah is perhaps better known because of its toughness. Strangely enough, too, it is unusually resistant to fire, and is proof against the white ant. Its use is principally for paving blocks, sleepers, bridge work and the like.

* * *

THE two best known oaks are Silky Oak and Tasmanian Oak, which are different from each other in many respects. One has a well marked silver grain on quarter cut surfaces whilst the other is straw colour to light brown, without the silver grain. One is a fairly soft wood, used for decorative work, furniture, etc., whilst the other is a hard, resilient wood useful in building construction, for paving blocks, sleepers, etc. All this wood can be beautifully finished and although our amateur workers have not the range of cut and the planed timber we have in England, they still have their own product which can lend itself to their work. Interest in wood-work and fretwork is increasing in Australasia, as it is in other overseas countries.

The Editor

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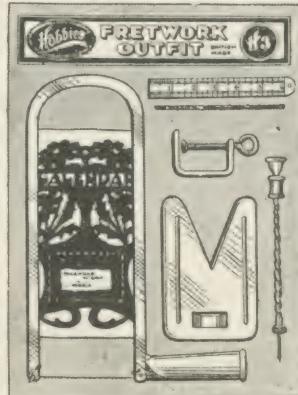


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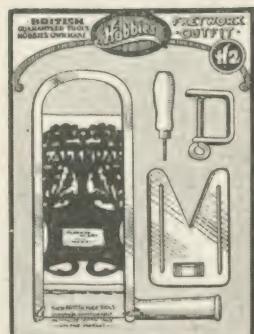
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STAMP COLLECTION CORNER

BEFORE we consider the main theme of this article we will mention a stamp which has been issued by Egypt; or rather three stamps of one set. They are all the same design as the one illustrated, in commemoration of the conference held at Montreux which decided on the abolition of Capitulations. You will see the words at the bottom of the stamp.

What is the significance of these three stamps, however? What is meant by Capitulations?

It is the term applied to arrangements between countries which are at different stages of civilization or which have very different religious faiths. The arrangement is that subjects of one state although residing within the jurisdiction of another, enjoy immunity from the laws of the latter state, and remain within the jurisdiction of the home state for civil and criminal matters.

One can quite understand, therefore, that Egypt, which up to now has allowed special privileges, is very pleased to have these abolished so that now the same law and justice in its maintenance is for all.

Now we come to the pictures. The second illustration shows the highest motor road in Europe. Curiously enough the name of the scene is shown at the bottom of the stamp, below the design and between this and the perforation.

This information is to the effect that the scene is the Col de l'Iseran (which is in Savoy on the borders of France and Italy) and that the road is 2,769 metres above sea level. If you convert this to feet it works out at 2,769 x 3.281 or approximately 9,100 feet. The

new road was opened this last summer, and the picture gives an excellent idea of the difficulties the engineers had in constructing such a road.

The third stamp, one from Brazil, with face value 300 reis, was issued in connection with the second South American Wireless Congress, and shows a beautifully clear picture of Rio de Janeiro.

This town, the capital of Brazil, is mainly built on the low coastal plain, but the suburbs extend on to the slopes of the surrounding mountains. As the stamp shows there is a very fine natural harbour, capable of accommodating the largest boats, and having over two miles of quays.

Coffee, sugar, rubber, timber, ores and diamonds comprise the chief exports. The stamp is printed by Messrs. Waterlow and Sons, and is beautifully executed.

The same remark applies to the next stamp, also from Brazil, and it is one of a set of six having three different designs.

This particular specimen, and also the 10,000 reis, bears the picture of the Palm Avenue in the Botanical Gardens at Rio. You can quite distinctly see the beautiful fountains playing and the mountain in the background.

The 200 reis of the same set shows a view of Rio de Janeiro, but as we have already had one of these this week we do not want another. The 1,000 reis gives us a view of a waterfall, the Grand Cataracts.

What a splendid introduction these three stamps which you have in front of you make to a pictorial collection. And what a wealth of material there is available in the stamps of the World for any collector who wishes to specialise in this type.



End of Capitulations



Europe's highest road



A picture of Rio de Janeiro



Botanical Gardens

STAMP PICTURES

Turn up your own stamp collection and count the number which you can show. Then if you have a catalogue turn over the pages carefully and see what a number there are which you have not got yet.

You should restrict the stamps which you are going to put in such a collection to views which are named. Or, if they are not named and you wish to include them, then before doing so you should find out to what they refer before mounting it in a picture collection.

The idea which should underlie the topic is that you should be able to show it to anybody and at the time be able to tell them just what they see, if possible describing each view, or giving some interesting facts about the place, where it is, what it is noted for, and why the stamp was issued.

You should also exclude statues and such stamps which would more appropriately be placed in other topics—for example waterfalls. The latter are generally very pretty, but there are so many of them that if you include one in a picture collection, then you will have a job to exclude the others and the collection would assume to be one of waterfalls instead of views.

A fishing picture such as that of the 4d. of the Western Samoa set could hardly go in, but the 1d. value of the same set could, because this is actually a picture of Apia (find out where it is and what it is noted for).

Some of the Belgian Congo stamps are beautiful, but they are not actually views of places. They are designs from an artist's pen to illustrate some points in the life of the Colony.

Use the right SCREWDRIVERS

Different jobs require different screws and they can only be driven in properly by the correct driver. Every handyman should have a range in his tool kit so he has the one wanted ready for use. Study these shown here and see what you need.



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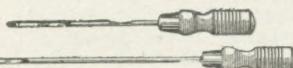
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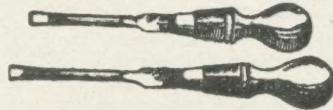


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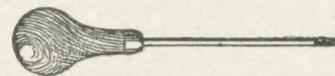
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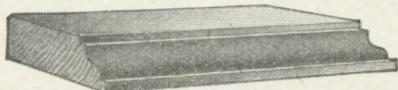


No. 5 SCREWDRIVER

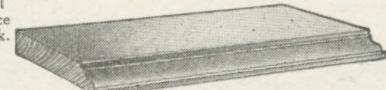
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MOULDING for the woodworker

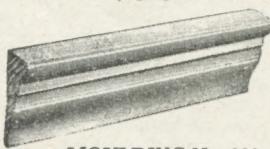
These are just the mouldings which the amateur carpenter needs. The base moulding and corner moulding are used in building up gramophone and wireless speakers and cabinets. The angle moulding No. 300, etc. is to cover bad corners, whilst No. 303 is as a cover moulding or drop ornament under an overhang. All are well cut, but quite cheap in price and suitable for any class of work.



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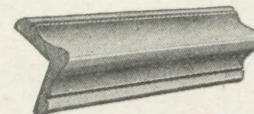
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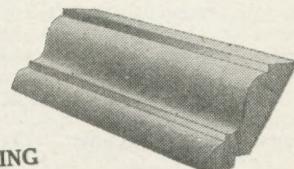
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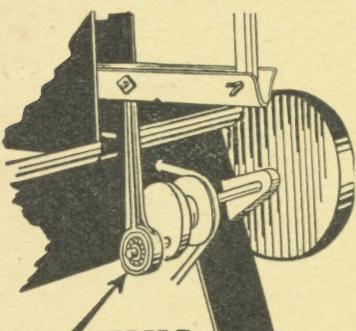
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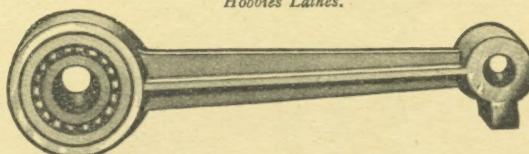
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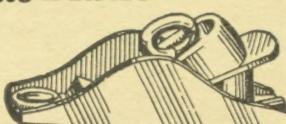
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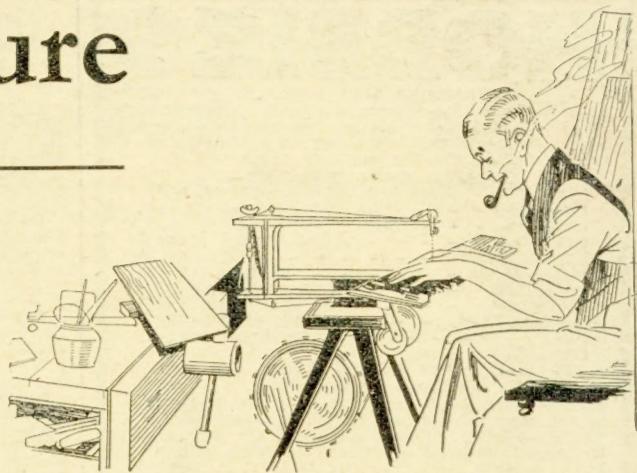
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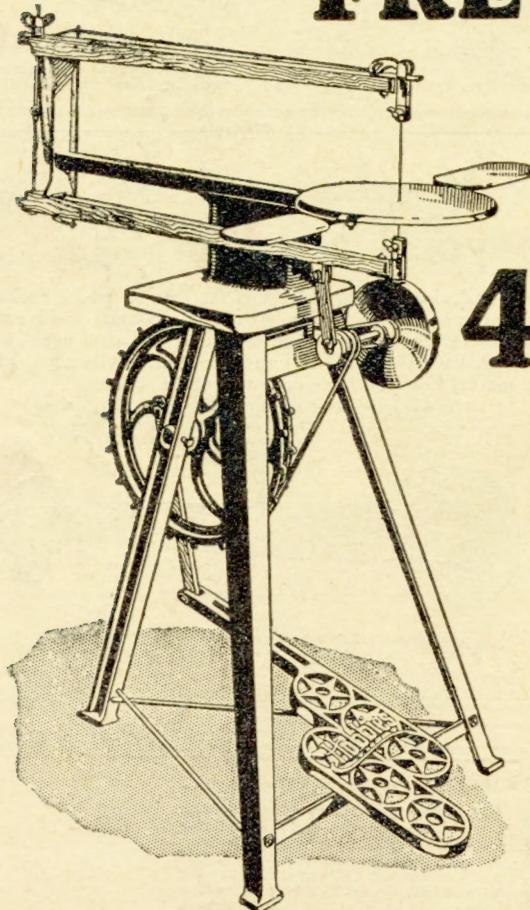
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